LITTLE BLUE BOOK NO. 653
Edited by E. Haldeman-Julius

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Author of "The Caveman Within Us," "Sanity In Sex," "Health and Self-Mastery Through Psycho-Analysis and Autosuggestion,' "The Puzzle of Personality," "Autosuggestion — How It Works," Psycho-Analysis—The Key to Human Behavior," "Rejuvenation—Science's New Fountain of Youth," "Rational Sex Series," Etc.

HALDEMAN-JULIUS COMPANY
GIRARD, KANSAS

Volume I
Rational Sex Series
By William J. Fielding

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PRINTED IN THE UNITED STATES OF AMERICA

# WHAT EVERY BOY SHOULD KNOW

## CHAPTER I.

### THE MARVEL OF NATURE

There is no more fascinating story than that of the method of nature to assure the continuance of life on this earth. As Dr. G. Stanley Hall has well said: "The history of the world is, at root, a love story." And by this is meant history in its broadest sense—life history, or biological history—and not merely political history, or the stories of various nationalistic groups of people in their struggles, internally and with their neighbors.

Not only is this a wonderful story, but it seems that nature has so constituted us mentally that she wishes us to know as much about it as is possible for us to find out. Otherwise, why should every normal child show a natural curiosity in this direction in the very early years of its life? Of course, in the great majority of cases, this praiseworthy curiosity is promptly suppressed, either by evasive answers, outright untruthfulness in replying, or even, on the part of more ignorant parents, chastisement.

The trait of curiosity is the most valuable gift a child can have. It is responsible for the impulse to learn, to seek, to find out about things. Of course, if the child discovers—which it readily does—that its questions or other

evidences of curiosity in regard to a certain phenomena are considered *improper*, and therefore forbidden, it must pursue a different course, which often affects its whole life disadvantageously.

From the moment that this attitude is impressed upon the child, whether the impression is given abruptly and comes as a shock, or whether it comes more subtly, he ordinarily does one of two things. First, he no longer looks confidently to his parents for the most vital information about his whole life and about life in general. Thus, a point of contact is broken, and a confidence shattered, which in most cases will never be pieced together again. Parent and child are separated by a great gulf of misunderstanding. The child no longer wholly trusts his parents.

Secondly, while the open, direct and natural method of seeking information has been frustrated, the curiosity has not been allayed. Instead, it has been driven into underground channels. The child will now seek his information from equally uninformed playmates, or worse still, from evil-minded older boys, who place all manifestations of sex in the privileged sphere of embellished smut.

Furthermore, the implication of impropriety which the matter-of-fact question aroused, leads to an overemphasis of the subject in the mind of the suppressed inquirer. It has no longer a matter-of-fact basis, but is something about which there hangs a mantle of alluring mystery, made the more secretly attractive because it is forbidden.

## EDUCATION BEGINS AT BIRTH

The question is often asked, "At what age should the boy or girl be told the facts of sex?" The answer to this is that there is no set questionnaire that can be filled in and handed to the child at a specific age.

Sex education properly is a part of an individual's general education. And education begins at birth. When the parents have accepted a rational attitude on the problems of sex, and in matters relating to the continuance of life, the subject assumes at the very beginning its proper relation with the general facts of experience.

In this book, I am dealing specifically with the boy, and therefore I shall talk to the boy and about him—and sometimes to the parents, as the book is written for the mutual interest and help of both.

Sometimes I shall put myself in the place of the boy. This is rather an easy matter, as it seems only yesterday when I was one myself, groping with the great puzzling problems that are common to all boys, and with practically no source of enlightenment.

And then again, I shall talk as a parent to a parent, as well as a parent to a boy. This is also perfectly natural, because I speak while writing these lines as the father of a boy nearing the age of puberty.

Puberty, or adolescence, which will be discussed at length in a subsequent chapter, is the most difficult period of a boy's experience—in fact in a person's whole life. It is not only

the turning point from boyhood to manhood, but it involves very complex psychological changes, or changes in one's mental attitudes toward many intimate personal and vital things, with all the emotional reactions that this condition implies.

The persons to whom the boy normally looks first for information are his parents. In the very early years, his mother is, of course, his constant attendant and the first source of information, as well as the medium for the fulfilment of his material wants and spiritual solace.

The wise mother will make the road of life easier for herself and for her child if she will at the beginning adopt the role of confidante and guide. As the infant will come to her expectantly for the satisfaction of the needs of babyhood, so the toddling boy will first come to her for a simple solution of the puzzling questions that face him at every hand. These questions should always be answered simply and directly, in terms suitable to the age and comprehension of the child.

The answer to the question *When?* therefore, is: "Sex education should be a part of the child's general education, beginning at birth." It should never be unduly emphasized, so as to give it an exaggerated importance, out of its true relation to the other normal facts of life; nor should it by any means be ignored or slighted. The best way is to be frank and honest and matter-of-fact in answering all

questions that come up concerning any phase of the sex question.

If this policy is pursued from the beginning, then there is laid the foundation for a rational, sane attitude on the subject of sex. A boy with this start is favored with a sound, healthy mental asset, which will save him from innumerable tormenting doubts, blighting fears and untold misery.

As he grows a little older, the father comes more into the boy's life, and becomes, or should become, increasingly his confident and companion. This relationship between father and son, breaking away from the old-time formal attitude of the mighty (almost the Almighty) and the lowly, and assuming a social and spiritual equality and comradeship is the greatest joy alike of fatherhood and boyhood.

Happily, when we get straight on this subject and in the right frame of mind, the very problems present their own solution. The fact that questions should be answered honestly and candidly, automatically eliminates the embarrassing necessity of inventing all sorts of fantastic lies, or of resorting to such ridiculous fictions as the "stork" story.

As an illustration, perhaps the question that throws consternation into the hearts of most conventional-minded parents is: "Where do babies come from?" This question is asked at some time or other by practically every child, and often at a very early age, even at three or four years of age. The question is a very natural one to ask. It is often prompted by

the arrival of a new baby in the household, or in the home of a relative or neighbor.

It is, of course, desirable that the simple questions relating to sexual phenomena be answered plainly long before this stage. Thus, the answering of this question truthfully is merely a detail in the routine of the child's day-by-day education.

If the subject of sex education has never been seriously considered before, however, this is a good time to begin. Do not delay it. The child is seeking legitimate information from the proper source. Do not disappoint him.

The best answer to the question is: "They grow from a tiny seed, very much the same as everything living has its beginning." It is usually unnecessary to go into elaborate detail at this time, except perhaps to say that the seed develops in the mother's body and grows into a little baby. Then when it is sufficiently strong it leaves its mama's body and comes out into the great big world.

With this simple, straightforward explanation, the child cannot but have an increased love and respect for his mother, as it demonstrates the actual flesh-and-blood bond between them. And it impresses far better than any fictitious story the fact of the self-sacrificing nature of motherhood.

If the process of sex education has already been started, which is desirable, then the boy may already know something of the method of reproduction of flowers and plants, and possibly of domestic animals or household pets.

The analogy of the baby and the lower orders of life starting from a seed and the former growing in the mother's body, until it is strong enough to stand the changes of temperature and climate, will therefore be a simple statement that the child can grasp and associate with the things he has learned or can learn to comprehend at an early age.

## HOW NATURE "CARRIES ON"

The world about us is filled with countless forms of life, from the most tiny, invisible creatures all the way up the biological ladder to the mammals, of which man is the highest order.

All these classes of life are products of nature, and nature in every case has devised some methods for the perpetuation of that particular species. It is necessary that every form of living thing reproduce itself, so that its kind will continue to exist.

The simplest forms of cell life have a very simple method of reproduction. This is the process of *fission* or *division*. The cell grows until it reaches a certain stage, then divides, forming two cells, which are as complete as the mother cell was. These cells follow the same course, a constant and continuous process of dividing, every cell becoming a parent cell and reproducing two like itself by division.

Of course, in this primitive form of life, the cells are exposed to numerous dangers and a very large proportion are destroyed, which is a good thing, otherwise the earth would soon

become over-run by the rapid reproduction of any one of these simple forms of life.

Even in certain fairly high types of plant life, this principle may be seen. In the yeast plant, for instance, the cell that constitutes the body of the plant at maturity simply becomes two cells, by division or pushing out a bud. Each of these two cells then becomes a new individual plant.

Some of the mosses, too, reproduce by the process of division and separation. The different parts separate from one another, then each part develops the missing members, and becomes a new plant. Following this course, any part of a moss that is separated from the parent moss may become a new and complete organism. By this method of division, the moss spreads to such places as it finds food.

Another phase of this same principle is seen in the common practice of cutting off shoots of shrubbery or bushes, and propagating them in this way. Thus, instead of planting seeds, we may take a cutting from the stem of mature shrubs, plant and water it—or better still, let the cut end soak in water until it develops tiny roots and then plant it—and the little piece of stem will, if all goes well, grow into a full size plant of its kind.

These, however, are the more simple processes of reproduction. The cases of the plants referred to are forms of continuation of an existing organism, rather than the reproduction of an entirely new one. They are interesting in tracing the steps of biological reproduction

up to the higher and more complex forms of life. In these examples, the factor of sex, as generally referred to, is not present, or at least, apparent.

With the exception of reproduction by cell division, however, the universal tendency of nature in the lower orders is to effect reproduction from seed, in the vegetable kingdom—which is a sexual process, as will be shown in the next chapter—and by means of the egg in most of those orders of animal life below the mammals.

But even the most simple form of cellular reproduction by division may, in a broad sense, be considered a form of sexual expression, mechanical and unconscious though it is. The primitive form of the cell life demands a simple automatic method of reproduction in keeping with its nature. It is, however, generally termed *asexual* (or non-sexual), to distinguish it from the definitely sexual processes.

In sex we find the essential touch of nature that makes the whole world kin, that affords the impulse to the continuation of life and that is as well the source of much of its ecstasy.

Among the lower forms of life, the role of sex seems to be the focal center of all life's activities. Everything else, even the search for food, and the preservation of the individual life are subordinate and revolve around the pivot of reproduction.

Among certain insects, for instance, the whole development of the individual life is an elaborate preparation for reproduction, and when

this is accomplished the life-function of that individual has performed its sole service to the species, and comes to an end.

With the ascent in the biological scale of life, however, sex expression becomes more and more a specific act, periodic or occasional, instead of the almost exclusive function of life.

But even where the sex act becomes an occasional or periodic function, there are retained many of the secondary characteristics of sex which constantly assert themselves, without, however, denoting a conscious sexual response.

These secondary sexual characteristics are both physical and psychic. They give color and beauty and music to nature, and all of these, as well as poetry, romance and idealism, to human life. The gorgeous feathers of the peacock, the majestic mien of the lion, the vocal triumphs of the nightingale, are all the hallmarks of sex in the marvelous handicraft of nature.

So, in the last analysis, sex in the upward scale of life becomes more specialized and refined, until in certain of the higher orders, it reaches its finest and highest expression in altruism, self-sacrifice, chivalry and devotion.

While, as I have stated, sex expression becomes more specialized and refined in the higher animals and among humans, unless debased in the latter by lustful degeneracy, its latent influence is nevertheless always in evidence.

For instance, the boy—the youthful reader of these lines—in the process of growth from birth

to adolescence, is being *prepared by nature* every minute of the time for the functions and responsibilities of manhood. And the greatest of these are the potentialities of fatherhood—assuring the continuance of the race.

Our boy is a man-in-the-making, and it behooves him to realize his responsibilities to himself, to his parents whom he loves and who love him, to his fellows as a social being, and, finally, to the future home circle which he himself even now vaguely looks forward to building when he reaches the great goal of manhood.

## CHAPTER II.

### SEX LIFE IN PLANTS

We have seen that sex activity is a universal phenomenon in nature, which links up life into a universal kinship. In this study it is desirable for two reasons to consider the reproductive aspect of plants. In the first place, it affords the means of giving us a highly illuminating insight into the nature of plant life on its own account; and, secondly, it is an admirable stepping stone to the more dynamic study of sex in animal life.

Even the most pious prudes seem to take the sex nature of plant life for granted. Or perhaps they never permit themselves to admit there is such a thing as sex in the world of vegetation. At least, we have yet to hear that

they would suppress the lily or the buttercup, which are among the most notable examples in nature of sex, nude, unblushing and unabashed.

Messrs. J. Arthur Thomson and Patrick Geddes have summed this up concisely in a passage of rare charm and beauty:

"Indeed, for the main idea and attitude of our sex studies, we have literally but to 'consider the lilies.' Not cut lilies, however, as both churchman and botanist have been mostly wont to do, there upon altar, here upon study table; but, quite literally, 'how they grow'—leaf and flower, nutritive and reproductive, self-maintaining and species-maintaining. Here is not only the simple rhythmic unity of biology, but the organic basis of morals and it is largely from losing sight of this that the long succession of 'systems of moral philosophy' which its professors so faithfully chronicle, so learnedly comment upon, have lost their hold upon men, or have never gained it.

"Honestly considering our lily, however, at its climax of perfection, in stature and blossom, beauty and fragrance, what is its secret? The symbol of purity; but why? Because it has something to be pure. Search nature through; there is no more open and simple yet magnificant expression of sex, naked and unashamed. in all the organic world."

### MALE AND FEMALE PLANTS

The boy who lives in the country has this obvious advantage over his city cousin. He can go out in the fields and woods and study nature at first hand, and as a rule he learns

from casual observation much about nature that is of value and that will be useful to him through life.

The resourceful city boy, however, is not without advantages in obtaining first hand knowledge of natural life. There are in many large cities botanical gardens and zoological parks and special exhibitions where he may, under competent guidance, pick up the rudiments of plant and animal life, supplemented by descriptive literature, which can be obtained in the school or public library.

Let us go into the garden together and see how the plants perform their biological function of reproducing themselves. Every boy is familiar with seeds, and knows that plants and flowers grow from seeds—the eggs of the vegetable world.

It is an endless-chain process of nature—the flowers produce seed, and the seed grow up into plants and flower, and so on, over and over and over.

Let us see how this works out in detail, or, in the case of those who are familiar with the process, repeat, for our own benefit, the story of plant reproduction.

Any complete flower, when dissected or taken apart, will be found composed of these main parts:

a. The "Calyx" or outer envelope composed usually of four or more "sepals."

b. The "corolla" or inner envelope, composed of "petals."

c. The "androœcium"—a circle of male or-

gans, composed of "stamens." *Androecium* is derived from the Greek words for *male* and *house.*

d. The "pistil," central portion, termed the "gynœcium", composed of "carpels." *Gynœcium* is derived from the Greek words for *female* and *house.*

This central portion contains the ovary or seed vessel, with a cap or cover called a "stigma". The *stigma* often stands out at a distance from the seed vessel at the tip of a column called the "style."

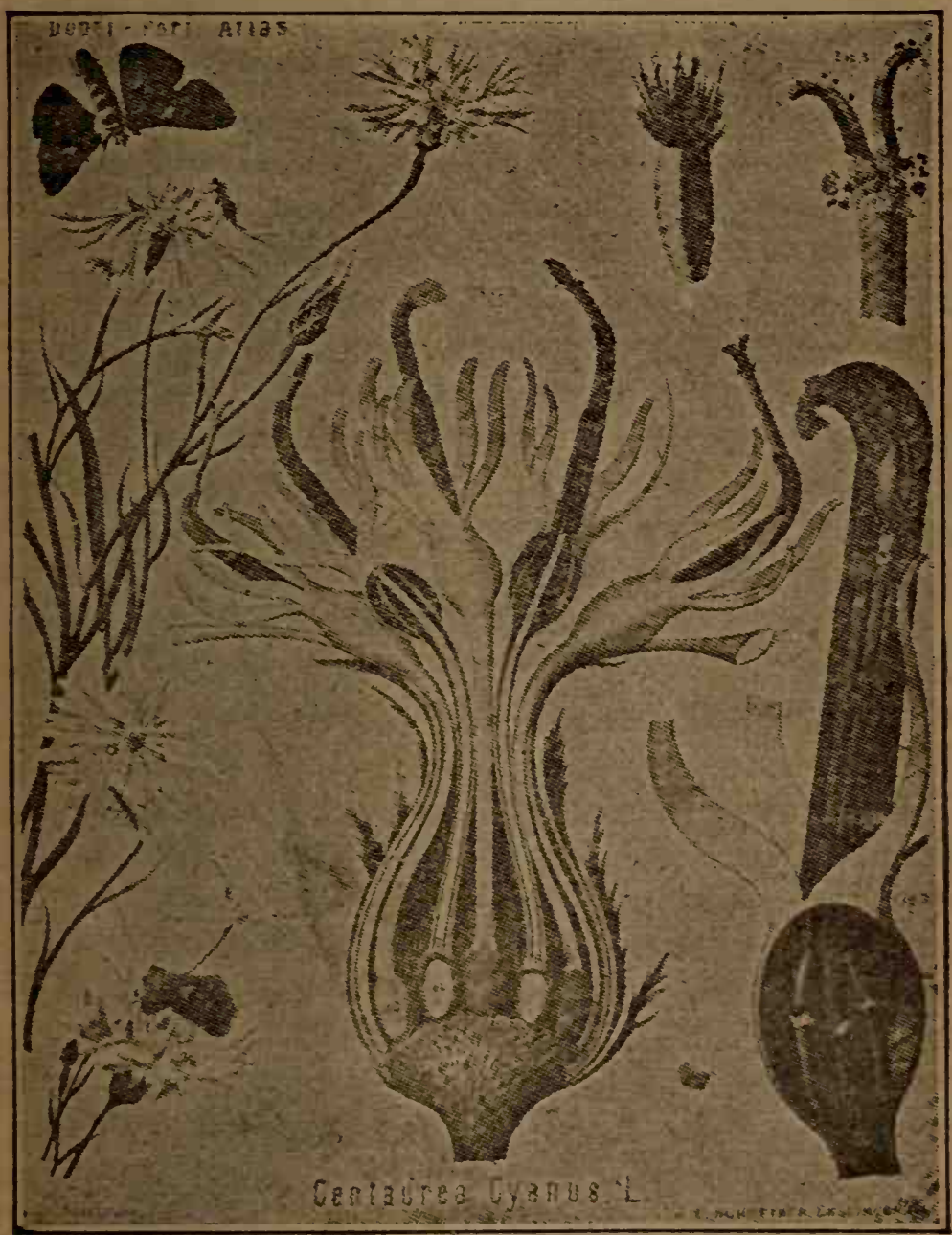
From the above, it will be seen that the ordinary complete flower is both male and female, or "*hermaphrodite*". There are some exceptions, of which the nettle is an example, that bear male and female flowers separately.

I have referred to the important influence of color and beauty in sexual life in the animal world, and the same thing is perhaps even more obvious in plant life, because the examples are more common.

What an endless array of beautifully colored flowers there are! What delicate and exquisite perfumes there are distilled in these little laboratories of nature! And all of this glorious outburst of color and aroma serves a very definite purpose in the process of reproduction.

Pleasing odors and bright colors attract insects, and all the flowers of plants which depend upon insects to assist in the means of fertilization have these assets of attraction.

On the other hand, flowers that are pollinated




The Cornflower, in Section, Showing the Stamens, Pistils, and the Ovary with Its Contents. Note the Insect Visitors.

by the wind need not be beautiful nor have an attractive smell, because the pollen will reach them without the aid of foreign insects.

The process of fertilization, once we understand the functions of the various parts of the flower, is readily grasped. First, there is the production of a male spore in pollen; second, the production of a female spore in an ovule; third, the fusion or union of these two spores or cells to form an embryo plant in a seed.

The male spore is produced in the *stamen*. At its tip in maturity, there is an "anther", consisting of one or more pollen sacs. These burst when ripe and discharge their pollen. Here, as everywhere, nature is prolific, and creates in the aggregate an enormous quantity of this life-giving element, so that at least a very, very little may ultimately reach its destination and fertilize the female element of the flower.

Pollen, which is analogous to the semen in animal life, contains the male spores (or sperms). When these reach the female spore in the flower ovary, the conjunction results in a fertilized seed, which, upon maturity, is the medium for next season's flowers.

The plant is, of course, unconscious of it, but there must be some beautiful little romances woven about the acts of fertilization of flowers. The pollen may reach the stigma, and through it, the ovule, in a variety of ways. It may be carried by butterflies or bees that seek the nectar of the flower, or by other insects that are pollen eaters, who carry some of the sticky

pollen on their feet upon their rounds among the flowers.

Pollen that depends upon the wind to carry it to the bosom of the lady flower is usually light and dry, and is necessarily produced in prodigious quantities, to assure at least a small portion reaching its destination and fertilizing a flower.

## PLANT AND INSECT ALLIES

One of the most remarkable things in nature is the affinity of plants and insects. It is, of course, taken for granted that plants and their flowers are a source of food supply for many insects; but the necessity for insects on the part of the plants is apt to be overlooked by the youthful observer.

Here we have an example of the methods of nature that have baffled the wisest of men. Some insects are absolutely dependent upon certain flowers for their food supply, and some plants are equally dependent upon certain insects for pollination and the production of seed.

While most insect-pollinated flowers may be pollinated by any one of many kinds of insects, there are some flowers which depend entirely upon a certain insect to carry the pollen so that the plant may reproduce and the species survive.

It is said that upward of a hundred kinds of insects visit the dandelion, whereas the red clover apparently depends upon the reliable humble bee.

Certain flowers have a little trap door over the honey sac, which only the weight of the bee can open. More remarkable are the flowers which keep their nectar in long tubes, so that only insects with extremely long tongues can reach it.

Possibly the most extraordinary example known of the absolute dependence of a flower upon a certain insect is the Orchid of Madagascar. This has a nectar tube nearly a foot long, and depends entirely upon a certain moth for its existence.

When Charles Darwin, the great naturalist, saw this flower he concluded that there must be an insect with a tongue long enough to sip its nectar and assure the continuation of this species of plant life. He made this deduction before it was known that any such insect existed. In fact, this novel plant was presented by his opponents as a means of refuting one of his theories of biological survival. Later observation of the plant and its life confirmed the existence of an unusual specimen of moth which was the sole means of enabling the Orchid of Madagascar to propagate its kind.

But let us return to the more commonplace plants, which offer us wonders enough to explore. In visiting flowers for their nectar, the insect usually has to touch either the stamens or stigma, or both. When this happens the pollen clings to the feet or wings of the insects on some of the flowers and on others is rubbed off. Pollen is therefore transported from flower

to flower in the meanderings of the insect pollen carrier.

To further help in the process, when the flower is ready to carry out the role of reproduction, the stigma becomes moist and in some flowers sticky. This indicates that it is in a condition to accept the pollen, which clings to the stigma. It is then mating time with the flowers, and the seeds are ready for fertilization and development. In some instances, this condition lasts for only a few hours; in others for a few days. The union of the pollen with the ovules starts the process of fertilization, which results in preparing the seeds for their normal function as the beginning of a new plant.

Although some flowers produce both pollen (the male element) and ovules (the female element), it often requires the pollen from some other flower to fertilize the seeds. This is known as "cross fertilization." In some cases the pollen falling upon the stigma of its own flower will germinate. Sometimes this "in-breeding" results in weaker and inferior plants, while in certain other cases the results are not unfavorable. Generally speaking, however, nature seems to favor "cross fertilization", and many of the elaborate and complicated processes described in this chapter, involving the co-operation of plants and insects, contribute toward this end.

## CARNIVOROUS PLANTS

"Carnivorous", literally meaning "flesh-eating", is a peculiar term to apply to a plant, but

there are certain varieties that have earned the name. They are also called "insectivorous", as the particular kind of fresh meat they subsist on is the insect. The most common example of *carnivorous* vegetation is the *pitcher* plant, found in the swamps in many parts of North America

One variety of the *pitcher* plant has a long, deep curled leaf, which exudes a sweet substance near the mouth of the "pitcher." This bait attracts the insect in search of food. Just beyond this substance, the surface of the plant is made very smooth and slippery by a coating of wax, with the result that the insect—even the sure-footed fly—slips or skids into the liquid which partly fills the deep hollow of the leaf.

As soon as the helpless victim gets into this mess, the fluid slowly proceeds to digest the insect. As the secretion of the "pitcher" is antiseptic, as well as digestive, bacteria do not attack the food during the slow process of digestion.

The *Venus fly-trap*, a relative of the *sundew*, is the most wonderful example of insectivorous plants. Its leaves are over an inch long, each with a winged stalk and a rounded blade. The upper surface of the blade has a number of prominent bristles. When an insect touches one of the bristles, the two halves of the leaves clap together like a flash, and the victim is caught like a rat in a trap. The secretion that follows is so abundant that it oozes out from the edges of the trap. Digestion proceeds, and

after the feast, the leaf reverts to its normal state of watchful waiting. Sir John Burdon Sanderson has discovered that the closing movement of the leaf is accomplished by an electrical change similar to that associated with the contraction of one of our muscles.

## CHAPTER III.

### SEX LIFE IN ANIMALS

The next step in the scale of sexual life is that of the animal world. In this sphere, we find, not necessarily a greater sexual activity —because it is hardly conceivable for any living thing to be more highly sexed than certain plants—but a different kind of sexual expression. The differences are such as are inherent in these two different classes of life—plant and animal.

In plant life, we found a purely automatic form of sex expression. In the animal realm, we find the consciousness and instinctive intelligence of this class of life applied to the functions of sex. Of course, much of the activity of animal life is automatic—perhaps everything that comes under the classification of "instinct" may be in this category—but there is added to this mechanical instinctiveness an awareness which displays considerable ingenuity and enterprise, in the face of difficulties, in achieving its ends.

The keynote of sexual expression in the ani-

mal world, as it is, in fact, of every phase of animal life, is instinct. The animal's sexual habits and manifold activities in the realm of reproduction are guided by wonderfully complex instinctive faculties.

There are two distinct commonplace methods by which animals propagate their kind. The more primitive or generally lower method in the scale of life is the "*oviparous*", (that is, producing eggs or ova that are hatched outside the body).

The other method of reproduction in animal life is the "*viviparous*" which means bearing the young alive.

Among *viviparous* animals, the young are retained within the body of the mother until they reach quite an advanced stage of development. In this way the unborn animal is nourished and developed by direct connection with the mother's blood and nervous system.

A third and less common method of bringing forth young is known as the "*ovoviparous.*" The young of this class, such as the kangaroo, opossum and other members of the "marsupial" family, are born quite imperfect and helpless, and are immediately placed in a pouch connected with the mother's abdomen. The mother's teats are located inside the pouch, so that the young animal lives and takes its nourishment there until it is able to move about. Even after that, it frequently returns to the pouch for shelter or protection, until it grows too large to continue this practice.

## FISH, AMPHIBIANS AND BIRDS

In considering the principal examples of the *oviparous* groups, we must take up three different stages in the evolution of animal life. First, come the fishes, which are the lowest order of the back-boned animals; then a step higher up in the biological scale are the amphibians (who live partly in the water and partly on land) and finally birds.

The eggs of fish are produced by characteristic organs, called *ovaries*, attached to the body-wall. Ovaries, meaning the organs where ova or eggs are developed, have already been referred to in the description of plant life. With the approach of the breeding season, the eggs increase rapidly in size, so that the great numbers that grow in the female fish fill the egg sac, where they are held until needed.

The two spermaries (sperm producing organs) of the male fish are in about the same location as the ovaries of the female. The secretion of the spermaries is a heavy, whitish fluid called the "milt." Under a high power microscope, the "milt" proves to be a mass of living, squirming cells. Each cell has a swimming tail or lash, which is characteristic of the spermatozoon, or fertilizing element, of all animals.

Immediately after the female fish has deposited her eggs in the nest or other appropriate place, the male passes over them and covers them with milt. By means of their swimming tails, the sperms find their way into

the egg. The merging of a sperm cell with an egg produces fertilization, which, if there is no interference, results in a new fish. With the tremendous hazards of fish life, however, there is great destruction and loss of eggs and little fish.

The reproductive habits of the salmon make up one of the most fascinating stories in the great romance of nature. The salmon spends most of its life in the sea, but in the early spring, when the female is filled with eggs and the male with sperm, they make their way up one of the rivers that their family has used for this purpose, possibly for ages.

On their way to the spawning grounds, where they go with unerring instinct, they leap up over falls and other barriers, force their way through rapid and shallow stream beds, and overcome seemingly insurmountable natural difficulties. In the meantime, the males indulge in fierce combat.

Upon their arrival at the appropriate spawning place, the mother salmon scoops away the gravel and sand of the river bottom with her tail, and in this nest she lays some of her thousands of eggs. The male immediately follows her and casts his milt upon the eggs before they are hopelessly scattered in the water. The fish parents then scrape sand over the eggs, and repeat the performance again and again until all the six or eight thousand eggs—which are about a quarter of an inch in diameter, and large for fish eggs—have been deposited. It

sometimes takes several weeks to complete this process.

While in the fresh water the salmon takes little or no nourishment, and, with their arduous struggle against the river current and over the falls and rapids, not to mention the close attention given to the fertilization of their eggs, they become lean and emaciated as they return to the sea. A great many of them, particularly the Pacific Coast salmon, die as a result of their strenuous activities in behalf of the species, and never reach their ocean home.

## THE FROG

Probably the most interesting of the amphibians to study, and one of the easiest to observe, is the frog. They live usually in damp places, but can manage well in dry. In the warm months they live on insects and slugs, which they catch with their long tongues, but in the winter they become drowsy, eat nothing, and bury themselves in the mud at the bottom of ponds and ditches, where they cease to breathe by means of their lungs, and respire by their skin instead.

With the coming of spring the frogs become active, and at the mating season, the male sings his well-known croaking solos to the female.

Frogs are extremely prolific creatures, the two ovaries of the female being filled with masses of pigmented, or dark-colored, ova. When ripe, the ova are set free in the body cavity and pass into the coiled oviducts, which

are prominent white tubes, which dilate near their ends into two funnel-shaped sacs, called the "*uteri*", the plural of *uterus*. These open into a common chamber, receiving the excretions from the two kidneys and the contents of the gut, as well as being the outlet for the eggs or *ova*. This general receiving chamber is called the "*cloaca*".

The reproductive organs of the male frog are smaller than those of the female. There are two testes, little yellowish oval bodies, lying in front of the paired kidneys. The stermatozoa from them pass by several ducts through the kidneys, and enter a duct, the "cloaca", common to both the kidneys and the reproductive organs.

During mating time, the male frog holds the female with its forelimbs and fertilizes the ova as she passes them into the water of the stream or pool in which they live.

When the eggs are hatched the little creatures which emerge are minute head-and-tail organisms, somewhat like the ordinary tadpole. They swim about in the water, and possess gills like fish, through which they breathe. Then they develop a mouth, and feed on vegetable matter.

In the second period, the true tadpole stage, their first gills become covered by a fold of skin, a new set of gills develop internally, the true lungs slowly grow larger, the mouth acquires jaws, and the limbs begin to form.

The tadpole can breathe air on the surface of the water, showing that it has two methods of respiration, one by means of its gills and

skin, and the other by the use of its lungs. The tail is long and contains much material on which this creature can subsist.

With the development of the frog, the tail gradually shrinks, while the limbs increase in size, until at last the rear appendage disappears altogether and the full-fledged frog, equipped with brain, eyes, a large tongue and the more complex internal organs, leaves the water and seeks food on land.

It is interesting to note how closely the frog resembles a fish in the early days of its career. Not only does it live entirely in the water and breathe by gills, but in this stage has a two-chambered heart like a fish, from which the gills are supplied with blood. As the lungs grow the gills wither up, because the blood previously sent to them now goes to the lungs; and, furthermore, the heart changes its fish-like character and becomes three-chambered as in the full-grown animal of its species.

In this respect, the frog differs from the next three great families—the reptiles, birds and mammals. All reptiles except crocodiles have a heart composed of three chambers, but the other two groups, including man, have four-chambered hearts.

## THE BIRD

The bird in every way is a distinctly higher type of life than the two classes just discussed. Birds, in fact, are the highest order of the vertebrates, below the mammals. They are among the most beautiful and interesting

of nature's creatures, as well as being vitally useful to man.

A famous ornithologist has said that if all birds should suddenly disappear, human life after a few months could not continue to exist on the face of the earth. The reason is that birds are large consumers of destructive insects, worms, grubs and other parasitic creatures, which, if not held in check by birds, would soon overrun the land, destroy all vegetation, and make it impossible for human life to continue. So we are in a very real sense the debtor of birds.

Birds are the first of any of the animals that seem, as a family, to express their emotions and feelings. They show a remarkable degree of tenderness and devotion in the care of their young, and express confidence and distrust in many ways. They court and quarrel, are friendly or definitely hostile, and express emotions that are shared by higher animals, including human beings. No other creatures work more diligently to build and maintain a home, or show more faithfulness in their domestic life.

Birds, as every boy knows, are hatched from eggs, of various sizes and colors, the common varieties of which are more or less familiar. When hatched, young birds are in one of two conditions. For example, chickens and ducklings come out of the eggs entirely covered with down. They are bright and open-eyed from the time they leave the shell, and in a few hours can venture from the nest and begin to feed themselves. They are more or less

independent of the mother, which makes it practical and profitable to hatch them in large numbers by the incubator. Young game birds and some of the gulls are also notable examples of precocity.

A large number of other young birds, however, such as the song-birds, are hatched, either entirely naked or partially covered with down. It is necessary for their parents to feed them for weeks before they are strong enough and able to look after themselves. Gradually, they become covered with feathers, which vary with the kind of the bird.

The bird is the next order of life above the reptile—and there have been creatures found in our time which are apparently in the transitional stage between the two-part reptile and part bird. Fossilized remains of similar creatures have also been found. It will therefore be of interest to compare the general similarities and dissimilarities of these two classes.

The body covering of birds contrast strongly with that of reptiles, whose skin is usually covered with scales. But birds, while having long since acquired feathers and wings for their life in the air, have scales on their legs and claws. Unlike reptiles, birds have no teeth, but jaws fitted with horny sheaths. Yet the very first birds, whose remains have been found as fossils, possessed teeth much like those of the reptiles.

The bird has a four-chambered heart, in contrast to the two and three-chambered hearts respectively of the fish and frog.

The female bird is peculiar in having lost one of its ovaries (or egg-developing organs). The left one only has remained. In a full-grown female bird, the ovary, a reddish body, lies above and between the kidneys, and covered all over with small eggs. Some of these will be distended with yolk, and, as they ripen, they burst from the ovary and are caught in the trumpet-shaped end of the oviduct. This oviduct is a coiled tube, in the upper part of which the white of the egg is added to the ovum, and in the latter part the shell.

The very last portion of the duct, called the "vagina", is strongly muscular. The egg is passed from this repository into the *cloaca*, from which the bird finally expells it when she lays.

The male organs of the bird are comparatively simple. The pair of testes lie in front of the upper lobes of each kidney, and a tube passes down on either side to open into the *cloaca*. The *spermatozoa* are stored in a small swelling on the last part of the tube.

When fertilization is about to take place, the male introduces the fertilizing fluid, which is made up of many minute, rapidly-moving bodies, or *spermatozoa*, into the *cloaca* of the female. These *spermatozoa* wriggle up though the oviduct and fertilize the egg-yoke soon after it enters that tube. After the fertilization has taken place in the oviduct, the egg-yolk receives the white portion and becomes enclosed in a membrane, and then further enclosed in a shell, which is first soft but becomes hard when

the egg reaches the *cloaca*. Only a few birds, the duck, for example, possess a muscular organ for injecting the fertilizing fluid.

Like other vertebrates, birds have a breeding season, when both the ovary and the testis increase in size, and produce *ova* and *spermatozoa*. Later, after the young are produced, the reproductive organs dwindle again, and a period of sexual inactivity ensues.

Birds reproduce at an early age, the young of one year being parents in the next. Some birds rear two broods in a year, but ordinarily only one brood is produced.

## THE RABBIT

The next step up the biological ladder, after the bird, which reproduces by laying eggs hatched outside the body, is the mammal; so-called from the Latin word "mamma," meaning "the breast". The mammal reproduces its young from an egg or ova fertilized and developed inside the body of the mother, and gives birth to a living being. All the mothers of this group nourish their young for a longer or shorter period after birth with milk from the breast. There are, of course, other structural differences between mammals and the lower animals, but this distinction in the method of reproduction is the outstanding difference.

A familiar and interesting example of the mammal group to consider is the rabbit. This will give us a good introduction to the essential facts about the bodies of mammals, and their reproductive processes, leading up to man himself.

Rabbits are called *rodents* from the peculiar shape of their upper and lower front teeth—the incisors—which are adapted to nibbling. Among the rodent family are such animals as rats, mice, hares, beavers and others. Like all mammals, except the whale and sea-cow, they possess four limbs, with which they run and dig. All mammals, too, except the whale, monkey and man, possess a third eye-lid, or fold of skin in the upper corner of the eye, which is also present in reptiles and birds.

The rabbit is a very helpless creature as far as any means of combative defense is concerned, and is exceedingly timid and fearsome. Consequently, he is equipped by nature with keen senses of hearing and smell, and fleetness of foot, which enables him to detect the approach and flee from his natural enemies. But even with these means of protection, great numbers of rabbits fall victims to foxes, owls and weasels, as well as to the hunter, and only his prolific rate of reproduction assures the continuance of the species.

The mother rabbit carries her young within the body but thirty days, when the little rabbits are born. The young cottontails are born blind and hairless, and utterly dependent upon the mother for nourishment and the nest for such protection as it may afford.

The mother rabbit performs her maternal duties faithfully, but the father rabbit is very negligent and remiss in his domestic responsibilities, and sometimes kills his own offspring.

The reproductive organs of the rabbit con-

The Mother Rabbit Carries Her Young in Long Tubes, the Uterus. Each Embyro Is Enclosed in a Separate Sac.

sist of but two structures, the pair of ovaries and the ducts which lead from the ovaries to the outside of the body. In this respect, the rabbit resembles the fish and the frog. In the case of the bird, one of its ovaries and ducts have disappeared.

The ovaries of the rabbit are three-quarters of an inch in length, attached to the body wall, behind and below the kidneys. There are many eggs in the ovaries, only a comparatively few of which are used in the lifetime of the animal.

The ovaries are connected with the oviducts, which have three divisions, or sections—the fallopian tube, the uterus and the vagina. Whereas, in the lower orders so far studied the oviduct and rectum have but one opening to the outside, in the mammals, the reproductive organs have a separate outlet. The male introduces the sperm into the vagina, or opening, by means of a special organ, the *penis*.

The testes of the rabbit are not on the outside of the body, as is the case with many mammals, including man, except at the breeding season. It is interesting to observe here that even in man, in the embryonic state, or before birth, the testes of the male are first located in the interior of the body, back of the kidneys, corresponding to the position of the ovaries in the female, but before birth, the testes descend from their original place to the scrotum which hangs outside the body. In some cases this descent is retarded and the baby boy is born without the normal external scrotum and testes; or maybe, one of the testis

is not fully descended and possibly under-developed.

Six or more small ova or eggs are discharged at intervals from the rabbit's ovaries into the oviduct. In their passage down the oviduct, they may be met and fertilized by the sperm cells from the male. When this occurs, they begin to develop, and as they reach the uterus they have already thrown out tiny extensions which cling to the walls of the uterus. Through these the unborn rabbits obtain nourishment and oxygen from the mother's blood.

The several ova that have become fertilized and that now repose in the uterus to develop, become surrounded by two envelopes, each forming a sac, the inner one of which is filled with a fluid. This protects the embryo from pressure and jars. When prenatal development is complete the young pass out through the vagina, and a litter of new rabbits are born.

## CHAPTER IV.

### SEX IN HUMAN LIFE

We have noted that, in the animal world, sex activities are governed entirely by instinct, and to that extent may be considered quite automatic and mechanical, although much ingenuity may be used at times in expressing these instinctive urges.

In considering the human being, we take up another class of life, which, in the sexual sphere, has many things in common with the

higher animal, and also very many dissimilarities. It is in confusing these likenesses and unlikenesses, and making them all appear as generally alike, that people with narrow ideas regarding sex have done a great deal of damage.

Some of these errors and inconsistencies may be summed up as follows:

Because animals are gifted with a sexual nature, many people insist upon calling all sexual expression, even in human beings "bestial." They might just as well call it "botanical," because, as we have seen, nearly all plant life has a highly developed sexual nature. And nothing could be more openly and unmistakenly sexual than the lily—the symbol of purity.

One might as logically condemn walking and running because animals use these means of locomotion; or condemn eating because animals indulge in this form of satisfying a physical appetite.

Having called sexual expression a form of "animalism," and therefore to be condemned, these people who are opposed to sex education say that "sex can be left to instinct"—it is unnecessary and undesirable to study nature. So our puritanical friends condemn a natural phenomenon because they see it only as a function of a lower order of life; whereas, of course, it is *universal*, and not peculiar to the lower orders. In effect, this is asking us to debase one aspect of our nature by treating it as a "bestial" characteristic, instead of dignifying our body as a whole by accepting it as an

organic unit, presided over by a reasoning human mind.

Man, being gifted with the faculty of reason and other attributes which the animal does not possess, must depend upon the development of his mind and rational faculties in order to realize the fulfillment of his possibilities as a human being. The animal does not have to go to all this trouble because he is born with certain definite instincts, which govern his conduct throughout life, not only in matters relating to sex, but covering every phase of his normal life's activities, which regulate his habits and enable him to satisfy his primitive wants.

It is absolutely illogical and often criminal in its effects to call any phase of normal human nature "animalism," because if we continually point out certain traits as animal traits some people at least will consider it excusable to act like an animal in their conduct. And when a human being reverts to the animal level, he acts in a manner antagonistic to human standards of conduct. In justice to the animal, we should say that he practically never abuses his sex functions, but uses them in accordance with the natural requirements peculiar to his species. The male animal is invariably considerate of the feelings of the female, and is never known to sexually abuse his mate. In this respect, at least, many a human being might take a lesson from the animal world.

So we see that sex, in its human expression, must be looked upon as a phase of human life, subject to study and enlightenment, and al-

ways under control of our reasoning faculties and responsive to ethical considerations.

## EGOISM AND ALTRUISM

In order better to understand the impulses and emotions which so largely influence our lives, and often result in distressing conflicts, it will be well to give some attention to the source of these feelings, and their characteristics.

We all have certain deeply implanted traits or instinctive tendencies, which have as their basis the necessity for the self-preservation of the individual. These are the *egoistic* instincts, which in the normal human being are modified by ethics, ideals, education and other factors in our training, and are never in the social being permitted to give unrestrained vent to themselves.

However, properly directed and counterbalanced by the opposite impulses of altruism, they are extremely serviceable in the development of the individual. They are conducive not only to self-preservation in emergencies, but to self-reliance, and the expression of individuality and personality in all its manifold forms.

When unrestrained, or not subject to consideration for others, these impulses may lead to grossly selfish extremes, offensive egotism, domineering traits of character and anti-social acts.

It is the normal, useful phases of the individualistic impulses, however, that we are

considering, and by understanding their nature, we may better control them, express them in harmony with a high idealism, and use them in the interest of social progress.

We have referred to the opposite impulses—*altruistic* ones (from *altera*, meaning "others"), which are directed toward the preservation of tne race and tend to make us social beings, prompt us to perform self-sacrificing acts, and which are the mainspring of the great heroic deeds which stand out in the history of human kind.

I do not limit these acts of heroism to the valorous deeds that have been glorified on the battlefield. They shine as well in the more prosaic history of civil life; the William Lloyd Garrisons and the Wendell Phillips whose great moral and intellectual courage was pitted against the formidable institution of chattel slavery; the men and women who, in all ages, have dared to go to prison for the rights of others; those who have given up life and liberty for the weak and oppressed; those who have made great self-sacrifices in the interest of science or in any branch of human progress.

The impulse behind all of these evidences of heroism was and is primarily altruistic. Of course, with the complexity of human motives, there is a constant overlapping of the egoistic and altruistic impulses. It may be that in making a real personal sacrifice, an individual will get a form of compensation in the shape of ego-satisfaction. But after all, the underlying impulse is altruistic, as the deed is in the in-

terest of others, and the self-satisfaction is in truth the reward of a conscience recognizing the performance of an act of social service.

## HUMAN REPRODUCTION

From the standpoint of anatomy, the purely physical side of the human sexual processes will be found in many respects similar to the sexual processes of the higher animals. Many of the names and terms used in describing the respective organs and their functions are common to both classes of life, which illustrates the helpfulness in studying animal life—and also plant life—as a preparation for the larger and more personal subject of human life.

This is true, notwithstanding the differences we have referred to, which are largely of a psychological nature—that is, due to the immense gulf between man and the animal in that the former is gifted with a reasoning mind, with all that this implies. This is the foundation of all mankind's possibilities for achievement, creative endeavor and the conquest of nature.

Our studies of the sex life of plants and animals have therefore already supplied us with an insight into the essential elements of sexual phenomena as manifested throughout nature. It will, however, be necessary and desirable to supplement this general knowledge with some specific facts relating to the sexual processes of human life.

This knowledge will not only add to the boy's general store of information, and therefore be an educational advantage as such, but it will

be a source of real helpfulness in meeting the problems that confront every boy with increasing seriousness as he approaches puberty.

## MALE SEX ORGANS

The human sexual organs are largely external, or lie outside, the body. They are the *penis* and the *testes* (testicles) enclosed within a sack called the *scrotum*.

The *penis* is a muscular organ, containing numerous blood vessels which when filled cause the organ to become rigid or erect. This is called an *erection*. The lower end of the penis, formed into a sort of head, is called the *glans*, or *glans penis*, and the skin which folds over this is termed the *prepuce* or foreskin.

Sometimes the prepuce fits too snugly over the glans causing irritation and permitting an accumulation of whitish secretion, which, if not removed frequently by bathing, results in a painful and inflamed condition of the glans. This is usually prevented by frequent bathing, but when this desirable hygienic measure does not prevent the trouble, then the *prepuce* should be removed. This is a simple and common operation, and a part of the religious rites and traditions of different sects in various parts of the world. The custom undoubtedly originated as a hygienic measure, the value of which was proven in the experiences of these people.

The tube in the center of the penis is called the *urethra*. This is the outlet from the bladder, through which the urine passes and it is also the outlet for the seminal fluid which conveys the male fertilizing element.

The two testicles are flat oval-shaped glands,

about one-and-a-half inches in length, one-and-a-quarter inches in width and nearly an inch thick. They are inclosed within the *scrotum*, a sack-like affair of thin wrinkled skin.

The testicle consists in its internal structure, of many lobes, conical in shape, with the bases reaching to the outside of the testicle, while the apices point toward the *epididymis*, a mass of coiled tubes and blood vessels. The structural detail of the male organs of reproduction and their functions are covered more fully in No. 654 of this series, "*What Every Young Man Should Know*," to which the reader is referred for more complete information on this general subject.

The *spermatozoa* are formed within the lobes of the gland by a complex process of cell division and cell generation, known as "spermatogenesis." The *spermatozoa*, commonly called "sperm cells" or "sperms," are remarkable minute bodies, consisting of a head, a neck and a tail. The neck section is shorter than the head, which constitutes about one-eighth or one-tenth of the total length. The tail has the power to make strong lashing movements and propel the sperm cell in its journeyings and attempts to meet the female egg or ovum.

The spermatic secretion from the lobes of the testicles, after passing through the tubes and coils of the *epididymis*, enters a single tube called the *vas deferens*, when after going through other passages and glands, notably the *prostate*, enters the urethra, which is the outlet of the male genital system.

## FEMALE SEX ORGANS

Unlike the male, the principal sex organs of the female are located within the body. This is a careful arrangement of nature, as it assures the largest possible protection to the organs under all conditions, and is a particular safe-guard to the growing baby within the pregnant mother's body.

The egg- or ova-producing bodies of the female are called *ovaries*. These are small almond-shaped glands, about one inch in length. In each ovary there are several hundred little ova or eggs in various stages of development.

At intervals of four weeks, from the time of puberty when the sexual organs begin their cycle of activity, one of these ova ripens and leaves the ovary. It passes into the fallopian tube, or oviduct, and enters the womb or *uterus*. Here it remains, if fertilized or impregnated, and develops into a baby. If not fertilized, it passes off with the menstrual flow.

The lower end of the womb enters into the vagina, a curved muscular tube, which helps to support the womb and also connects it with the external parts. The vagina, which is about three-and-a-half inches in length, is sometimes called the birth canal, because the baby must pass through it in the process of birth.

The so-called external organs of the female are comparatively inconspicuous, being folds of skin, called the *labia majora* and the *labia minora*, and a very small structure named the *clitoris*. The latter organ is highly sensitive and corresponds somewhat to the penis of the male. Just back of the clitoris, within the folds

of the *labia*, is the *urethra*, or outlet of the bladder.

The ova are round cells of protoplasm, much larger than the male fertilizing element, the spermatozoa. When carefully isolated, they may be seen with the naked eye. When the spermatozoa of the male reaches the womb, after being injected into the vagina, they pursue their search for the ova, often wriggling up into the fallopian tubes in their quest. When one of the *spermatozoa* meets an ovum, the former, being much smaller, penetrates the latter and the union of these two cells constitutes the act of fertilization or impregnation.

## THE HUMAN-IN-THE-MAKING

When impregnation has taken place, the fertilized ovum attaches itself to the walls of the uterus. Considering the minuteness of the original cell, it grows with amazing rapidity. In the early stages of the human embryo, as the unborn baby is called at this stage, it so closely resembles the embryo of many of the higher animals that, if separated from their respective mothers, they could not be distinguished one from another.

At the end of the second month, the human characteristics become more prominent, but the embryo still retains certain likenesses to that of other animals, and has the vestige of a small tail.

A cord-like projection has formed, called the *umbilical cord*, connecting the abdomen of the embryo with a soft, spongy mass known as the *placenta*, or "after-birth." The mother's blood

which nourishes the growing embryo and supplies it with oxygen, passes through the umbilical cord. At birth this cord is cut close to the baby's abdomen, and the scar is the naval, or *umbilicus*, which the small boy may better know as the "belly-button."

At an early stage the embryo becomes enclosed in a floating membranous sack, suspended within the well-protected regions of the uterus. The liquid which surrounds the embryo is called the "anmiotic" fluid.

By the end of the third month the genital organs are developed so that the sex can be determined, and the heart action may be detected. The mother usually notices the first motion of the child between the fourth and fifth month, the time of "quickening."

From this time on, the *fetus*, as the baby-in-the-making is now called, being fairly well formed, grows at an increasingly progressive rate, so that the pregnant condition of the mother becomes very noticeable. There is also a great drain on her system to nourish and carry about this new, developing organism within her, and she may become pale-faced and bear other evidences of the ordeal of motherhood.

In the normal course of events, the baby is born at the end of nine months. This new and helpless specimen of humanity is too well known to our youthful reader to need further comment.

## CHAPTER V.

### PUBERTY—THE TURNING POINT OF LIFE

In the lives of all mammalian animals, there is a comparatively short period in which the young go through a process of maturing, or a climax of development. At this time, there is a rather sudden blossoming out of the whole being, and the formerly callow and undeveloped individual takes on the characteristics of the adult. Prominent among the features of this transformation is the unfoldment of the sexual life, and the maturing of the reproductive powers.

In the male, besides the increase in the size of the sex organs, the muscles of the whole body become larger and firmer, and all the so-called secondary sexual characteristics soon reach their full normal development. For instance, the horns of the bull, the antlers of the deer, the prongs of the antelope, get heavier and sharper during this period. The animals gain in weight and strength. They become aggressive and combative with their male competitors, and markedly attentive to the female.

Among human beings, puberty—the initial turning point toward adulthood—usually begins at about the age of fourteen, lasting to seventeen in the temperate North American climate. The whole adolescent period, however, which is a broader term, may be said to extend from about thirteen or fourteen to twenty or twenty-

two, ending at the time of acquiring full adult size and development.

On the sexual side, puberty indicates that the boy can produce semen capable of fertilizing the ovum of the female). Thus the youth comes into new powers and new responsibilities. He is fortunate, indeed, if his training and associations have been such as to develop the strength of character and manliness which will stand him in good stead in this important period, and lay the foundation for a wholesome, healthy and upright manhood.

The secondary sexual characteristics assert themselves very pronouncedly in the youth from the onset of puberty. There is a decided change in the voice, which becomes deeper. The hair begins to grow on the face, soon necessitating the first shave. Hair also grows more abundantly on different parts of the body—in the pubic regions (just above the sexual organs), in the arm pits, and on the chest.

The girl, too, at the pubescent period, shows a corresponding development of the feminine characteristics. Her figure, previously little differentiated from that of the boy, now undergoes marked changes. Her breasts round out. Her arms and legs become more shapely; the hips enlarge, and she otherwise gives evidence of the physical charm and gracefulness of young womanhood.

## MENTAL CHANGES

The mental changes are no less pronounced than the physical. Whereas, heretofore, the boy has been more or less careless (mostly

more) in his appearance and rather indifferent to girls, he now shows a decided interest in the opposite sex. This sudden awakening to the attractiveness of feminine charms, and the unpreparedness to cope with the new situation, often results in an awkward feeling of self-consciousness when in the presence of girls. This, of course, normally wears away with the self-assurance that comes with continued associations, although in the case of some young men, the high degree of self-consciousness in the presence of the opposite sex is never lost.

One of the outstanding effects of this changed attitude toward girls is the development of the social impulses. The boy becomes chivalrous toward the fair sex and his gallantry fosters the spirit—normal to the male throughout the natural world—in him of the protector and defender of girlhood when need be. This is a desirable quality for the rightminded boy, and is the basis of a respect for womanhood, which, rightly started, lasts throughout life.

In early puberty, the self-assertive impulses of the boy and his desire to attract the attention and win the admiration of the girls, or perhaps of some particular girl, lead to a form of braggadocio. He is often as noisily self-assertive as the barnyard rooster. But this crude expression of masculinity ordinarily gives way in the course of time to the more normal attributes of young manhood.

Puberty is also the time when the boy undergoes a spiritual breaking away from the tie which up to this period had bound him exclusively to the family circle. This is the be-

ginning of a definite transference of the youthful individual's interest from the home to the outside world. Figuratively, he pulls loose from the apron-strings dominion of childhood, and while loving his mother no less, his capacity for love and affection broadens so as to respond to feminine charms elsewhere—and masculine friendships, too.

At this period, new boyhood friendships are formed. There is a tendency toward gregarious or group associations that are characteristic of all social beings. This spirit is constructively fostered, as well as is the desire for the display of physical prowess, by such organizations as the Boy Scouts, and similar activities centered upon woodcraft, hiking and other pastimes that bring youth out into the open and in contact with nature.

Lacking these constructive and character-developing opportunities, the adolescent youth too often drifts into the pitfalls of harmful gang activities. As these spontaneous expressions of youthful enthusiasm and mischievousness may easily drift into questionable, and even highly injurious ways, the desirability of healthy, constructive outlets for the vitality and energy of youth is readily seen.

## SEXUAL DEVELOPMENT IN PUBERTY

The development of the sex organs in puberty corresponds with the general physical and mental revolution that is taking place within the man-in-the-making. The process of turning or changing a boy into a man is indeed a revolution. The penis and testicles

increase in size, about doubling their former dimensions. As previously stated, the testicles develop the power to produce semen containing spermatozoa, capable of fertilizing the human ovum, and when these organs become fully capable of procreation, the period of puberty is complete.

Simultaneous with the production of semen which has an external outlet through the penis, an internal sexual secretion is produced, called the sexual or gonadal *hormone*, which is absorbed into the blood. This internal secretion is responsible for the marked physical and mental changes that take place in the development of the boy at puberty. It is analogous to similar changes that occur in all the higher animal life.

Experiments on animals have proved the nature and functions of this internal secretion in influencing the complete development of the individual. If the testicles are removed when the animal is young, thereby depriving it of the sexual hormones when the time comes for them to be produced, the characteristic traits of the male animal do not appear. This is frequently done with roosters to produce heavy capon for food. But the rooster does not grow into the proud, self-assertive cock-of-the-walk that he normally would be. He is, of course, unable to fertilize the hen, and has no sexual interest in the female chicken. Nor does he develop the comb and spurs that are characteristic of the rooster. Furthermore, he becomes a complaisant, submissive fowl, with none of the aggressiveness of the male. He is literally

an unsexed chicken, whose vitality all goes to size and bulk. The removal of the ovaries of the female animal or bird, called "spaying," likewise destroys the characteristic traits and functional activities of the individual of that sex.

In ancient times (and even now in some parts of the world), it was the custom to castrate (as they call this practice) young boys, so as to unsex them for the selfish interests of rich and influential persons. Thus the unsexed youth, if he lived—and it is said that as many as four out of five died as a result of the shock to the organism—became a eunuch in the harem of a rich man. It has also been done to prevent the voice of the youth from changing into the deeper voice of the man—thus male sopranos were developed.

## NIGHT EMISSIONS

When the testicles begin to produce semen upon the onset of puberty, there results at intervals an accumulation of this secretion. From time to time this must escape, which it does in a very natural and normal way in the form of nocturnal or night emissions. That is to say, once or twice or three times a month, during sleep, the congestion of semen in the testicles is relieved by the escape of the excess secretion through the urethra of the penis.

It is very important that the boy understand the significance of this phenomenon. In many cases, boys have been frightened beyond words when they have first had this experience, and had had no previous knowledge of it.

When the boy has been informed of the nature of nocturnal, or night, emissions, and knows that, when they are not too frequent, they are normal sexual manifestations of the male from the time of puberty, he feels reassured when they begin.

This serves, also, to remind the boy of the new responsibility that nature has imposed upon him. He is no longer a *mere boy.* He has definitely reached the turning point between boyhood and manhood. Now experiencing the conscious awakening of his sexual nature, which powers may be conserved and developed on the one hand, or abused and dissipated on the other, he should recognize the importance to his life as a coming man, to take the former course.

Night emissions may take place without any apparent corresponding mental influence; or they may be accompanied by a dream having some more or less sexual significance. In some cases, the physical reaction upon the nervous system from the congested vessels in the testicles will cause dreams having a bearing upon the situation. In other cases, sexual thoughts cultivated in the daytime will so influence the mind during sleep that the resulting state of mind will stimulate the testicles to act in the form of an emission.

As stated, night emissions, taking place on an average of from once or twice to three times a month, are natural occurrences. When they occur much oftener than this, it is usually due to over-stimulation by encouraging sexual thoughts in the daytime and the excess may

have a weakening effect on the system. Too frequent emissions should be sufficient notice to the boy to turn his mind to other and more healthy activities; to devote more of his time to sports, physical training and those mental pursuits which are dissociated from sexually stimulating ideas.

The keynote of all character development and accomplishment is self-control. This implies the maintenance of high ideals, that are the bulwark alike of the individual throughout boyhood and manhood. It is both an individual and a social asset.

Self-control in the adolescent boy's sexual life is, after all, achieved by the aid of the following measures:

1. A general knowledge of the processes of sex life throughout nature.

2. The cultivation of an idealism protective alike to the individual and society.

3. The formation of good clean habits that are conducive to the mental and physical well-being of the individual. This, of course, includes companionship of wholesome boy and girl friends, plenty of outdoor exercise to develop the muscles and bodily organism as a whole—the better to build up the physical framework of manhood; and the careful avoidance of influences and evil associations which may result in abusing the developing sexual organs.

## MASTURBATION

Probably one of the most perplexing problems which concern adolescence is that of mas-

turbation, or "self-abuse,"—that is, playing with or stimulating the sexual organs so as to produce an orgasm, or flow of semen. This practice is an unseemly one, and, when it reaches the extent of becoming a habit, may even be injurious. On the other hand, the ill effects have been grossly over-exaggerated by many of the writers of an earlier period who have been more concerned apparently with moralizing than with scientific truths.

Undoubtedly more damage has been done by the well-meaning, but misinformed or over-zealous writers who have told of the frightful results that are bound to occur from masturbation, than there has resulted from masturbation itself.

Masturbation is sometimes taken up by very young children as a result of irritation to the *glans penis*, and the attempt to secure relief by rubbing the organ, which illustrates the need for keeping the sexual organs clean. It may also be started by the infant discovering accidentally that handling these sensitive parts gives a pleasant feeling, and so continuing into a fixed habit, like biting the finger nails, picking the nose or playing with other portions of the anatomy.

After getting ourselves straight on this subject, and recognizing that such dire effects as insanity, feeble-mindedness and incurable physical disabilities are not even unusual effects of masturbation, we will admit that its practice is decidedly against the boy's best interests.

The ill effects are, primarily, that it tends to

become a habit, and as such causes an undesirable drain on the system, influences adversely the tone of the nervous organization, and thereby retarding or preventing the fullest development of the powers of manhood. And what boy does not aspire to this enviable estate! If the boy's strength and vitality are sapped by masturbation, or other form of sexual abuse, he will be placing a handicap in his own way toward the realization of his highest ambitions and worthiest aims.

There is another concomitant evil associated with the habitual practice of masturbation. As it is necessarily a secret habit, often accompanied by a feeling of moral guilt, the boy is drawn more and more to himself, becomes isolated and unadaptive, and as such unsocial, and sometimes anti-social. It may have a marked influence against his achieving the full vigor of manhood.

Without any unnecessary threats and ridiculous scares, the boy will therefore readily see for himself the desirability of refraining from masturbation; or, having at any time indulged in it, will turn his attention to the healthy constructive activities of boyhood that have been mentioned on the foregoing pages. It is better not to have formed this unseemly habit, but it is never too late to mend.

## CHAPTER VI.

### PREPARATION FOR MANHOOD

Having arrived at the stage of puberty, with a general knowledge of sexual phenomena in nature and of what the continuance of life implies, our boy has the best possible foundation for clean healty manhood. He is doubly fortified by the assurance that comes with straightforward information and sound knowledge, both as to what to expect in the normal course of adolescence, and what to avoid.

With this groundwork, of course, character development and ethical ideals are bound up, and much of the latter depends upon the influence of home environment. Every normal parent is vitally interested in the well-being of the boy and girl, and this interest is most effectively shown by helping the young people to help themselves. They naturally will be influenced by the conduct and habits of their parents and senior members of the household, as well as by companions and chums.

The point is that the status of parent and child involves an element of mutual consideration and reciprocal relationship. Character formation should be achieved by example and precept, and any attempt to secure results by a dominating attitude or by a cut-and-dried formula will assuredly fail. We are dealing with the human element, and it has to be handled

in a human way. It is primarily a psychological problem, with all the ramifications that are bound up with the mental and physical unfoldment of the human individual.

## HEALTH AND STRENGTH

The problem of the boy's health and strength is a matter involving many considerations, such as diet, sleep, exercise, personal hygiene, attention to the bowels and other regular physical functions, etc., as well as to the cultivation of constructive mental attitudes.

In the matter of diet, a well balanced selection of plain, wholesome foods, comprising the recognized essentials for the growing body, and the avoidance of highly seasoned and spiced foods, are the first principles. This subject is related to regularity of the bowels, and the prevention or overcoming of constipation. There should be a free, normal passage of the bowels at least once every twenty-four hours, even two or three may be better, and this habit is best acquired by attention to the need, and to the eating of plenty of coarse foods, and fresh and cooked fruits and vegetables. Water should be drunk freely between meals.

Ordinarily the question of exercise is not one of much concern with the boy. He usually gets plenty of it in play and sports, and while occasionally he may have to be cautioned against over-exertion, with the normal boy the subject of exercise takes care of itself. The delicate boy, or the one subnormal physically, should be supervised in this respect, so as to assure him adequate possibilities for development and

overcoming his handicaps without risking injury through exhaustion. It should be needless to add that the growing boy requires plenty of sleep to overcome the fatigue and wear and tear of the day, and when he becomes intelligently interested in his own well-being, he will not have to be coerced into retiring at a reasonable hour at night.

The adolescent boy should under no circumstance take up the habit of using tobacco. It has an injurious effect upon growth, and, being a narcotic, interferes with the proper functioning of the brain of the boy. It may also affect the heart or other organs unfavorably.

## VENEREAL DISEASES

No boy is properly prepared to meet the exigencies of life who has not some knowledge of those scourges of the human race—the venereal diseases. The chief of these are gonorrhea and syphilis. They are highly infectious, and while generally contracted by promiscuous sexual intercourse, they may also be acquired by other means, so that innocent people are sometimes the victims of these diseases.

Prostitutes—that is, women who engage in sexual intercourse for a price—are almost invariably infected with one or both of these diseases, as also are the "clandestine" girls—those who, while not considered professional prostitutes, sell sexual favors occasionally to supplement their earnings. And, of course, any girl who "takes a chance" in the sexual act, no matter how rarely, *may* become infected.

Now, then, as there are two parties to the sex act—the male and the female—it follows that men are carriers of venereal diseases as well as women. Just as the prostitute and her promiscuous sisters carry the germs of syphilis and gonorrhea, so do men who consort with these women also spread infection, often giving the disease to innocent girls who have been induced to submit to the sex act for the first time by various promises or under the excitement of sexual stimulation. And in submitting to the sex act, the girl, of course, also risks the possibility of becoming impregnated, as well as acquiring a serious disease.

All of this shows the necessity of being forewarned regarding the consequences of promiscuous sexual intercourse. The boy or young man, knowing these facts, and having a proper regard for womanhood as exemplified by his mother, and his sisters, if he has any, will not blindly take chances at ruining his own health, and possibly be responsible for bringing a terrible infection to his future wife and children.

As I have stated, venereal diseases once acquired may be transmitted to others by non-sexual means. The germs may be spread by means of public towels and toilets, common drinking glasses or other utensils and clothes or other articles that have been used or handled by a diseased person and then used by another.

## GONORRHEA

Gonorrhea, the more common of the venereal diseases, and said to be the most prevalent of

all human maladies, is caused by a germ, the *gonococcus*. It is characterized by a morbid discharge from the genital organs, and inflammation of the urinary tract. While its results are sometimes serious and far-reaching in men, it is particularly virulent in women, and may attack the uterus, ovaries and fallopian tubes.

It is generally agreed that the majority of operations on women for diseases of the reproductive organs is due to gonorrheal infections. Poisoning of the blood, rheumatism, affections of the heart and other organs, may result from gonorrhea. It also produces sterility—the inability to become a parent—in men and women. Among its worst effects are diseases of the eye, when the infection is carried to that organ, particularly among infants who have contracted the disease from the birth canal of the mother in the process of birth.

## SYPHILIS

Syphilis, while less prevalent, is more insidious and more terrible in its effects. The acquired form begins with a local sore or hard chancre, and the germ, the *spirochaeta pallida*, in the course of a few days after infection, spreads throughout the whole system. If not given proper treatment *at once*, the secondary and tertiary (third) stages follow in their regular course, producing skin eruptions, affections of the glands and in the end it may result in paralysis, locomotor ataxia, brain maladies or decay of the bones.

The effects on woman's reproductive system

are particularly serious and may make it impossible for her to give birth to a live baby. And when a living baby is born it may turn out to be one of the most pathetic of all cases, a syphilitic infant—a little weazened, old-looking baby, with disease in its blood, deformities of bone and infirmities of flesh.

With this brief outline of the frequent and possible results of venereal infection, both on the individual directly infected and on the innocent victim of the next generation, the advisability of leading a clean, wholesome sexual life is self-evident.

Should one of these diseases be contracted, however, it is important to bear in mind that, *if taken in hand at once*, it can be effectively controlled and cured *in time* after thorough treatment. The family physician should be consulted; advertising quacks never! This subject is discussed more fully in the following volume of this series, No. 654, *"What Every Young Man Should Know."*

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